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MICHAEL PORKSCH
BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN, LLP
12400 WILSHIRE BLVD.
7TH FLOOR
LOS ANGELES, CA 90025

EXAMINER	
D AGOSTA, STEPHEN M	
ART UNIT	**PAPER NUMBER**
2683	7

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/894,448	SEBASTIAN, PEROOR K.	
	Examiner	Art Unit	
	Stephen M. D'Agosta	2683	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-34 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-34 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 28 June 2001 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 6.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

The IDS dated 6-28-01 has been received and is acknowledged by the examiner.

Drawings

The drawings were received on 6-28-01 and have been reviewed by the draftsperson and examiner.

Claim Objections

Claims 2 and 22 objected to because of the following informalities: The limitation regarding "using all of said RF bandwidth if channel quality meets desired channel quality" is confusing to the examiner since it appears from reading the specification that the overall bandwidth stays the same but the number of timeslots reduces – the examiner interprets this limitation to mean that the mobile uses those timeslots that are available and has nothing to do with the total RF bandwidth available. Appropriate correction is required. Failure to correct will lead to a USC 112 rejection.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 8-11, 15, 17-21 and 28-31 rejected under 35 U.S.C. 102(e) as being anticipated by Cudak et al. US 6,253,063 (hereafter Cudak).

As per **claim 1**, Cudak teaches a method (title) for adapting a wireless communications link between a transmitter and a receiver wherein information is communicated in a downlink from a BTS to multiple subscriber units and in an uplink direction from said multiple subscriber units and in an uplink direction from said multiple subscriber units to said BTS (abstract and figure 2 show uplink/downlink) comprising:

Establishing a RF bandwidth as a communications channel in a wireless communication system (C1, L50-55 teaches RF communication between a mobile station and base station, as does figure 1)

Establishing a desired channel quality for uplink communications between said transmitter and said receiver over said communications channel (C2, L3-23 but specifically L18-23 where the mobile determines the C/I ratio, also see C2, L48-50 whereby the mobile selects a data rate based on the interference level detected), and

Reducing said RF bandwidth of said communications channel for uplink communications to achieve said desired channel quality (C2, L3-23, but specifically L22-23 where the BTS determines the difference level of interference and establishes a final data rate which would be more/less depending upon the interference conditions, see claim 4, column 4). The examiner notes that increasing/decreasing RF bandwidth is achieved by increasing/decreasing the number of timeslots used in the uplink.

As per **claim 8**, Cudak teaches a method for an RF communications system (title, abstract and figure 2 show uplink/downlink) and dividing said RF bandwidth into uplink sub-channels (figure 2 top diagram shows divided RF bandwidth for uplink channels and assigning at least one of said uplink sub-channels to said transmitter for uplink communications (figure 2 top diagram shows "UPLINK TX" which refers to sub-channels in the uplink channel sent from a transmitter).

As per **claim 9**, Cudak teaches a method for an RF communications system (title, abstract and figure 2 show uplink/downlink) wherein dividing said RF bandwidth into uplink sub-channels includes dividing said RF bandwidth into "n" uplink sub-channels of equal RF bandwidth size, where "n" is an integer (figure 2, top diagram, shows uplink downlink sub-channels in equal portions that are an integer value).

As per **claims 10-11**, Cudak teaches a method for an RF communications system (title, abstract and figure 2 show uplink/downlink) further including:

Establishing a desired SNR ratio as said desired channel quality for uplink communications (Cudak teaches measuring/determining a C/I ratio which reads on an SNR as is known in the art, C2, L3-67)).

Assigning a number of "m" uplink sub-channels to said communications channel such that said desired SNR ratio is met for uplink communications where "m" is an integer (abstract and determination of C/I and an initial data rate and an integer number of sub-channels, C2, L18-24 which reads on a desired SNR and use of uplink sub-channel(s)).

As per **claim 15**, Cudak teaches a system (claim 11) for adapting a wireless communications link between a transmitter and a receiver wherein information is communicated in a downlink from a BTS to multiple subscriber units and in an uplink direction from said multiple subscriber units and in an uplink direction from said multiple subscriber units to said BTS said wireless communications system having an established communications channel with a known RF bandwidth (C1, L50-55 teaches RF communication between a mobile station and base station, as does figure 1) and a desired channel quality in the uplink direction (C2, L3-23 but specifically L18-23 where the mobile determines the C/I ratio, also see C2, L48-50 whereby the mobile selects a data rate based on the interference level detected, also abstract and figure 2 show uplink/downlink) comprising:

Means for reducing said RF bandwidth of said communications channel for uplink communications between said transmitter and said receiver to achieve said desired channel quality if said desired quality will not be achieved using all of said RF bandwidth of said communications channel for uplink communications (C2, L3-23, but specifically L22-23 where the BTS determines the difference level of interference and establishes a final data rate which would be more/less depending upon the interference conditions, see claim 4, column 4).

The examiner notes that increasing/decreasing RF bandwidth is achieved by increasing/decreasing the number of timeslots used in the uplink.

As per **claim 17**, Cudak teaches a method for an RF communications system (title, abstract and figure 2 show uplink/downlink) **but is silent on** including quality of service manager supplying desired quality to means for reducing said RF bandwidth.

Cudak does teach an apparatus for both the mobile and BTS to make initial/final decisions on the current interference (eg. quality) and the setting/changing of the data rate (eg. is set initially by the mobile and can be changed up/down by the BTS) [C2, L18-23] which reads on a hardware/software service manager/controller that can change the data rate based on interference.

It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to modify Cudak, such that a quality of service manager supplies desired quality of service for reducing RF bandwidth, to provide means for hardware to monitor interference levels and raise/lower data rates based on said measurements.

As per **claim 18**, Cudak teaches a method for an RF communications system (title, abstract and figure 2 show uplink/downlink) **but is silent on** including a time slot manager for allocating additional time slots to said uplink communications channel with said reduced RF bandwidth.

Cudak does teach an apparatus at the BTS that makes a decision as to the final data rate based on the difference level of interference (C2, L18-23) which reads on a hardware/software manager/controller that allocates how many time slots to use.

It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to modify Cudak, such that a timeslot manager allocates additional timeslots to uplink with reduced RF bandwidth, to provide means for hardware/software to monitor interference levels and raise/lower data rates/timeslots based on said measurements.

As per **claim 19**, Cudak teaches a method for an RF communications system (title, abstract and figure 2 show uplink/downlink) and inherently includes a channel manager for dividing said established communications channel into uplink sub-channels (figure 2, top diagram shows partitioned uplink/downlink sub-channels).

As per **claim 20**, Cudak teaches a method for an RF communications system (title, abstract and figure 2 show uplink/downlink) and wherein said means for reducing said RF bandwidth operates in response to a signal received from said transmitter at said receiver, wherein said receiver is located within said BTS and said transmitter is located within one of said multiple subscriber units (abstract and C2, L3-23 teaches both BTS and mobile can send/transmit RF bandwidth settings/changes which reads on the claim).

As per **claim 21**, Cudak teaches a method (title) for adapting a wireless communications link between a transmitter and a receiver wherein information is communicated in a downlink from a BTS to multiple subscriber units and in an uplink direction from said multiple subscriber units and in an uplink direction from said multiple subscriber units to said BTS (abstract and figure 2 show uplink/downlink) comprising:

Identifying a RF bandwidth that is available for use as a communication channel in a wireless communication system (C1, L50-55 teaches RF communication between a mobile station and base station, as does figure 1)

Establishing a desired channel quality for uplink communications between said transmitter and said receiver over said communications channel (C2, L3-23 but specifically L18-23 where the mobile determines the C/I ratio, also see C2, L48-50 whereby the mobile selects a data rate based on the interference level detected),

Selecting a portion of said RF bandwidth that enables said desired channel quality to be met for uplink communications (C2, L3-23, but specifically L22-23 where the BTS determines the difference level of interference and establishes a final data rate which would be more/less depending upon the interference conditions, see claim 4, column 4). The examiner notes that increasing/decreasing RF bandwidth is achieved by increasing/decreasing the number of timeslots used in the uplink.

As per **claim 28**, Cudak teaches a method for an RF communications system (title, abstract and figure 2 show uplink/downlink) and dividing said RF bandwidth into uplink sub-channels (figure 2 top diagram shows divided RF bandwidth for uplink channels and assigning at least one of said uplink sub-channels to said transmitter for uplink communications (figure 2 top diagram shows "UPLINK TX" which refers to sub-channels in the uplink channel sent from a transmitter).

As per **claim 29**, Cudak teaches a method for an RF communications system (title, abstract and figure 2 show uplink/downlink) wherein dividing said RF bandwidth into uplink sub-channels includes dividing said RF bandwidth into "n" uplink sub-channels of equal RF bandwidth size, where "n" is an integer (figure 2, top diagram, shows uplink downlink sub-channels in equal portions that are an integer value).

As per **claims 30-31**, Cudak teaches a method for an RF communications system (title, abstract and figure 2 show uplink/downlink) further including:

Establishing a desired SNR ratio as said desired channel quality for uplink communications (Cudak teaches measuring/determining a C/I ratio which reads on an SNR as is known in the art, C2, L3-67)).

Assigning a number of "m" uplink sub-channels to said communications channel such that said desired SNR ratio is met for uplink communications where "m" is an integer (abstract and determination of C/I and an initial data rate and an integer number of sub-channels, C2, L18-24 which reads on a desired SNR and use of uplink sub-channel(s)).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 2-4, 6-7, 12-13, 16, 22-24, 26-27 and 32-33 rejected under 35 U.S.C. 103(a) as being unpatentable over Cudak as applied to the claims above, and further in view of Gilbert et al. US 6,016,311 (hereafter Gilbert).

As per **claim 2**, Cudak teaches a method for an RF communications system (title, abstract and figure 2 show uplink/downlink) wherein reducing said RF bandwidth is preceded by:

Determining a current channel quality for uplink communication between said transmitter and said receiver over said communications channel (C2, L3-23 but specifically L18-23 where the mobile determines the C/I ratio, also see C2, L48-50 whereby the mobile selects a data rate based on the interference level detected)

Reducing said RF bandwidth of said communications channel to achieve said desired channel quality and utilizing said reduced RF bandwidth of said communications channel for uplink communications if said current channel quality does not meet said desired channel quality (C2, L3-23, but specifically L22-23 where the BTS determines the difference level of interference and establishes a final data rate which would be more/less depending upon the interference conditions, see claim 4, column 4).

But is silent on

Utilizing all of said RF bandwidth of said communications channel for uplink communications if said current channel quality meets said desired channel quality.

The examiner notes that while Cudak teaches increasing data rate if interference is low, there is no disclosure of using all RF bandwidth. The examiner therefore has found a second reference that teaches adapting the data rate based on a user's need for higher performance (eg. when supporting broadband)

Gilbert teaches an adaptive TDMA system that can provide "a myriad of timeslot allocation schemes" (abstract, figures 2, 3a/3b and C4, L31-65). Gilbert states that virtually any uplink/downlink allocation can be established (C9, L19-22) which reads on "all RF bandwidth".

It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to modify Cudak, such that all RF bandwidth is utilized, to provide means for providing as much bandwidth to the user as required, up to the maximum.

As per **claim 3**, Cudak teaches a method for an RF communications system (title, abstract and figure 2 show uplink/downlink) **but is silent on** further including allocating additional uplink time slots for uplink communications over said communications channel with said reduced RF bandwidth to maintain a desired uplink transmission rate between said transmitter and said receiver over said communications channel with said reduced RF bandwidth.

The examiner notes that while Cudak does teach allocating additional timeslots, it is not done in the context of maintaining a desired transmission rate, but rather in response to high/low interference levels.

Gilbert teaches an adaptive TDMA system that can provide "a myriad of timeslot allocation schemes" (abstract, figures 2, 3a/3b and C4, L31-65). Gilbert's asymmetric TDMA duplexing method advantageously allows channels to use time slots depending upon the needs of the user in uplink or downlink directions (C4, L57-65). Hence, Gilbert would use additional timeslots to achieve/maintain a desired data rate to support the user's need for more data throughput (eg. timeslots) if/when interference levels rose.

It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to modify Cudak, such that additional time slots are used with reduced bandwidth to maintain a desired uplink rate, to provide means for an asymmetric time division duplexing scheme to be used to support additional timeslots when a desired uplink is required by the user.

As per **claim 4**, Cudak teaches a method for an RF communications system (title, abstract and figure 2 show uplink/downlink) **but is silent on** taking time slots from other uplink communication channels to compensate for said additional uplink time slots that are allocated to said uplink communications channel with said reduced RF bandwidth. The examiner notes that Cudak does not specifically state taking timeslots from other uplink channels – the mobile may have a fixed number of slots to use (as disclosed by Gilbert – see figure 1).

Gilbert teaches asymmetric time division duplexing that can take timeslots from other uplink channels (C7, L1-12, figure 2 and C7, L13-30)

It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to modify Cudak, such that timeslots are taken from other uplink

timeslots as compensation, to provide means for supporting a required user bandwidth by dynamically adjusting which timeslots are used/taken.

As per **claim 6**, Cudak teaches a method for an RF communications system (title, abstract and figure 2 show uplink/downlink) **but is silent on** using time division duplexing (TDD) for downlink and uplink communications.

Gilbert teaches use of time division duplexing for both uplink and downlink communications (abstract and C4, L31-39).

It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to modify Cudak, such that TDD is used, to provide dynamic allocation of uplink/downlink resources for optimal transmission of data.

As per **claim 7**, Cudak teaches a method for an RF communications system (title, abstract and figure 2 show uplink/downlink) **but is silent on** wherein the RF bandwidth for downlink communications is greater than the RF bandwidth for uplink communications.

Gilbert teaches an adaptive TDMA system that can provide "a myriad of timeslot allocation schemes" (abstract, figures 2, 3a/3b and C4, L31-65). Gilbert's asymmetric TDMA duplexing method advantageously allows channels to use time slots depending upon the needs of the user in uplink or downlink directions (C4, L57-65).

It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to modify Cudak, such that the bandwidth for downlink is greater than uplink bandwidth, to provide means for large downloads to be transmitted when required.

As per **claim 12**, Cudak teaches a method for an RF communications system (title, abstract and figure 2 show uplink/downlink) **but is silent on** further including allocating additional timeslots for uplink communications to maintain a constant uplink transmission rate.

The examiner notes that while Cudak does teach allocating additional timeslots, it is not done in the context of maintaining a constant transmission rate, but rather in response to high/low interference levels.

Gilbert teaches an adaptive TDMA system that can provide "a myriad of timeslot allocation schemes" (abstract, figures 2, 3a/3b and C4, L31-65). Gilbert's asymmetric TDMA duplexing method advantageously allows channels to use time slots depending upon the needs of the user in uplink or downlink directions (C4, L57-65). Hence, Gilbert would use additional timeslots to achieve/maintain a constant data rate to support the user's need for more data throughput (eg. timeslots) if/when interference levels rose.

It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to modify Cukdak, such that additional timeslots for uplink will maintain a constant transmission rate, to provide means for a user-required data rate to be maintained by using additional timeslots if interference is creating problems.

As per **claim 13**, Cudak teaches a method for an RF communications system (title, abstract and figure 2 show uplink/downlink) **but is silent on** further including utilizing time division duplexing to communicate in the uplink and downlink directions.

Gilbert teaches use of time division duplexing for both uplink and downlink communications (abstract, C4, L31-39).

It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to modify Cudak, such that TDD is used for up/downlink, to provide dynamic allocation of uplink/downlink resources for optimal transmission of data.

As per **claim 16**, Cudak teaches a method for an RF communications system (title, abstract and figure 2 show uplink/downlink) **but is silent on** further including allocating additional uplink time slots for uplink communications over said communications channel with said reduced RF bandwidth to maintain a desired uplink transmission rate between said transmitter and said receiver over said communications channel with said reduced RF bandwidth.

The examiner notes that while Cudak does teach allocating additional timeslots, it is not done in the context of maintaining a desired transmission rate, but rather in response to high/low interference levels.

Gilbert teaches an adaptive TDMA system that can provide "a myriad of timeslot allocation schemes" (abstract, figures 2, 3a/3b and C4, L31-65). Gilbert's asymmetric TDMA duplexing method advantageously allows channels to use time slots depending upon the needs of the user in uplink or downlink directions (C4, L57-65). Hence, Gilbert would use additional timeslots to achieve/maintain a desired data rate to support the user's need for more data throughput (eg. timeslots) if/when interference levels rose.

It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to modify Cudak, such that additional time slots are used with reduced bandwidth to maintain a desired uplink rate, to provide means for an asymmetric time division duplexing scheme to be used to support additional timeslots when a desired uplink is required by the user.

As per **claim 22**, Cudak teaches a method for an RF communications system (title, abstract and figure 2 show uplink/downlink) wherein reducing said RF bandwidth is preceded by:

Determining a current channel quality for uplink communication between said transmitter and said receiver over said communications channel (C2, L3-23 but specifically L18-23 where the mobile determines the C/I ratio, also see C2, L48-50 whereby the mobile selects a data rate based on the interference level detected)

Reducing said RF bandwidth of said communications channel to achieve said desired channel quality and utilizing said reduced RF bandwidth of said communications channel for uplink communications if said current channel quality does not meet said desired channel quality (C2, L3-23, but specifically L22-23 where the BTS determines the difference level of interference and establishes a final data rate which would be more/less depending upon the interference conditions, see claim 4, column 4).

But is silent on

Utilizing all of said RF bandwidth of said communications channel for uplink communications if said current channel quality meets said desired channel quality.

The examiner notes that while Cudak teaches increasing data rate if interference is low, there is no disclosure of using all RF bandwidth. The examiner therefore has found a second reference that teaches adapting the data rate based on a user's need for higher performance (eg. when supporting broadband)

Gilbert teaches an adaptive TDMA system that can provide "a myriad of timeslot allocation schemes" (abstract, figures 2, 3a/3b and C4, L31-65). Gilbert states that virtually any uplink/downlink allocation can be established (C9, L19-22) which reads on "all RF bandwidth".

It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to modify Cudak, such that all of the RF bandwidth is utilized for uplink if quality meets said desired quality, to provide as much bandwidth as possible o the user when required and during low interference.

As per **claim 23**, Cudak teaches a method for an RF communications system (title, abstract and figure 2 show uplink/downlink) **but is silent on** further including allocating additional uplink time slots for uplink communications over said communications channel to maintain a desired uplink transmission rate between said transmitter and said receiver over said communications channel with said reduced RF bandwidth.

The examiner notes that while Cudak does teach allocating additional timeslots, it is not done in the context of maintaining a desired transmission rate, but rather in response to high/low interference levels.

Gilbert teaches an adaptive TDMA system that can provide "a myriad of timeslot allocation schemes" (abstract, figures 2, 3a/3b and C4, L31-65). Gilbert's asymmetric TDMA duplexing method advantageously allows channels to use time slots depending upon the needs of the user in uplink or downlink directions (C4, L57-65). Hence, Gilbert would use additional timeslots to achieve/maintain a desired data rate to support the user's need for more data throughput (eg. timeslots) if/when interference levels rose.

It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to modify Cudak, such that additional uplink timeslots are allocated, to provide increased bandwidth as needed by the user.

As per **claim 24**, Cudak teaches a method for an RF communications system (title, abstract and figure 2 show uplink/downlink) **but is silent on** taking time slots from other uplink communication channels to compensate for said additional uplink time slots that are allocated to said uplink communications channel. The examiner notes that Cudak does not specifically state taking timeslots from other uplink channels – the mobile may have a fixed number of slots to use (as disclosed by Gilbert – see figure 1).

Gilbert teaches asymmetric time division duplexing that can take timeslots from other uplink channels (C7, L1-12, figure 2 and C7, L13-30)

It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to modify Cudak, to provide means for taking timeslots from other uplink channels, to provide additional bandwidth to the user as required.

As per **claim 26**, Cudak teaches a method for an RF communications system (title, abstract and figure 2 show uplink/downlink) **but is silent on** using time division duplexing for downlink and uplink communications.

Gilbert teaches use of time division duplexing for both uplink and downlink communications (abstract and C4, L31-39).

It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to modify Cudak, such that TDD is used, to provide dynamic allocation of uplink/downlink resources for optimal transmission of data.

As per **claim 27**, Cudak teaches a method for an RF communications system (title, abstract and figure 2 show uplink/downlink) **but is silent on** wherein the RF bandwidth for downlink communications is greater than the RF bandwidth for uplink communications.

Gilbert teaches an adaptive TDMA system that can provide "a myriad of timeslot allocation schemes" (abstract, figures 2, 3a/3b and C4, L31-65). Gilbert's asymmetric TDMA duplexing method advantageously allows channels to use time slots depending upon the needs of the user in uplink or downlink directions (C4, L57-65).

It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to modify Cudak, such that the bandwidth for downlink is greater than uplink bandwidth, to provide means for large downloads to be transmitted when required.

As per **claim 32**, Cudak teaches a method for an RF communications system (title, abstract and figure 2 show uplink/downlink) **but is silent on** further including allocating additional timeslots for uplink communications to maintain a constant uplink transmission rate.

The examiner notes that while Cudak does teach allocating additional timeslots, it is not done in the context of maintaining a constant transmission rate, but rather in response to high/low interference levels.

Gilbert teaches an adaptive TDMA system that can provide "a myriad of timeslot allocation schemes" (abstract, figures 2, 3a/3b and C4, L31-65). Gilbert's asymmetric TDMA duplexing method advantageously allows channels to use time slots depending upon the needs of the user in uplink or downlink directions (C4, L57-65). Hence, Gilbert would use additional timeslots to achieve/maintain a constant data rate to support the user's need for more data throughput (eg. timeslots) if/when interference levels rose.

It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to modify Cukdak, such that additional timeslots for uplink will maintain a constant transmission rate, to provide means for a user-required data rate to be maintained by using additional timeslots if interference is creating problems.

As per **claim 33**, Cudak teaches a method for an RF communications system (title, abstract and figure 2 show uplink/downlink) **but is silent on** further including utilizing time division duplexing to communicate in the uplink and downlink directions.

Gilbert teaches use of time division duplexing for both uplink and downlink communications (abstract, C4, L31-39).

It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to modify Cudak, such that TDD is used, to provide dynamic allocation of uplink/downlink resources for optimal transmission of data.

<u>Claims 5, 25 and 34</u> rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Cudak and Gilbert as applied to the claims 3, 23 and 34 respectively, and further in view of Barlett et al. US 5,557,603 (hereafter Barlett).

As per **claim 5**, Cudak in combination with Gilbert teach a method for an RF communications system as discussed above and Cudak teaches indicating changes in time slot allocations as a result of the uplink channel with the reduced RF bandwidth (abstract teaches that mobile selects initial data rate (eg. time slot(s)) to use and BTS selects final data rate (eg. time slots) to use which reads on indicating time slot allocations)

but are silent on

Indicating to said transmitter, the frequency range of the reduced RF bandwidth that is to be used for subsequent uplink transmissions, and

Barlett teaches a controller has the ability to move a call on to that time slot in order to make spare capacity available on a different time slot whereby the base station instructs the mobile to <u>change its time slot</u> with or without a <u>change of frequency</u> and simultaneously the base station and mobile change to the new time slot (and frequency if necessary) [C4, L7-16]. Indication of any new timeslot/frequency must be provided between transmitter/receiver to ensure correct operation.

It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to modify the combination of Cudak and Gilbert, such that a new frequency range can be indicated, to provide means for moving data calls to ensure optimal capacity is achieved.

As per **claim 25**, Cudak in combination with Gilbert teach a method for an RF communications system as discussed above and Cudak teaches indicating changes in time slot allocations as a result of the uplink channel with the reduced RF bandwidth (abstract teaches that mobile selects initial data rate (eg. time slot(s)) to use and BTS selects final data rate (eg. time slots) to use which reads on indicating time slot allocations)

but are silent on

Indicating to said transmitter, the frequency range of the reduced RF bandwidth that is to be used for subsequent uplink transmissions, and

Barlett teaches a controller has the ability to move a call on to that time slot in order to make spare capacity available on a different time slot whereby the base station instructs the mobile to change its time slot with or without a change of frequency and simultaneously the base station and mobile change to the new time slot (and frequency if necessary) [C4, L7-16]. Indication of any new timeslot/frequency must be provided between transmitter/receiver to ensure correct operation.

It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to modify the combination of Cudak and Gilbert, such that a new frequency range can be indicated, to provide means for moving data calls to ensure optimal capacity is achieved.

As per **claim 34**, Cudak in combination with Gilbert teach a method for an RF communications system as discussed above **but are silent on**

Indicating to said transmitter, the frequency range of the reduced RF bandwidth that is to be used for subsequent uplink transmissions, and

Barlett teaches a controller has the ability to move a call on to that time slot in order to make spare capacity available on a different time slot whereby the base station instructs the mobile to change its time slot with or without a change of frequency and simultaneously the base station and mobile change to the new time slot (and frequency if necessary) [C4, L7-16]. Indication of any new timeslot/frequency must be provided between transmitter/receiver to ensure correct operation.

It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to modify the combination of Cudak and Gilbert, such that a new frequency range can be indicated, to provide means for moving data calls to ensure optimal capacity is achieved.

Claim 14 rejected under 35 U.S.C. 103(a) as being unpatentable over Cudak as applied to the claim 1, and further in view of Barlett.

As per **claim 14**, Cudak teaches a method for an RF communications system (title, abstract and figure 2 show uplink/downlink) **but is silent on** including indicating to said transmitter the frequency range of the reduced RF bandwidth that is to be used for subsequent transmissions.

but is silent on

Indicating to said transmitter, the frequency range of the reduced RF bandwidth that is to be used for subsequent uplink transmissions, and

Barlett teaches a controller has the ability to move a call on to that time slot in order to make spare capacity available on a different time slot whereby the base station instructs the mobile to change its time slot with or without a change of frequency and simultaneously the base station and mobile change to the new time slot (and frequency

if necessary) [C4, L7-16]. Indication of any new timeslot/frequency must be provided between transmitter/receiver to ensure correct operation.

It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to modify Cudak, such that a new frequency range can be indicated, to provide means for moving data calls to ensure optimal capacity is achieved.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

1. Parkvall et. Al. US 6,5423,736.
2. Naegeli et al. US 6,574,797.
3. Gardner et al. US 5,857,147.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen M. D'Agosta whose telephone number is 703-306-5426. The examiner can normally be reached on M-F, 8am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Trost can be reached on 703-308-5318. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Stephen D'Agosta

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